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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,394	04/14/2004	Vishwas V. Hardikar	004.0128	8468
29906	7590	05/18/2006	EXAMINER	
INGRASSIA FISHER & LORENZ, P.C. 7150 E. CAMELBACK, STE. 325 SCOTTSDALE, AZ 85251			GEORGE, PATRICIA ANN	
			ART UNIT	PAPER NUMBER

1765

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/825,394	HARDIKAR, VISHWAS V.	
	Examiner	Art Unit	
	Patricia A. George	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) 1-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/14/04</u>   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of group II, claims 36-43, in the reply filed on 3/13/2006 is acknowledged.

Claims 1-35 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group I, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 3/13/2006.

### *Claim Rejections - 35 USC § 102/103*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 36 rejected under 35 U.S.C. 102(e) as being anticipated by Patel et al. (2003/0171239).

Patel et al. teach methods of CMP rinsing, cleaning, or etching (i.e. wetting – see para. 004), which uses a composition comprising non-ionic surfactant with HBL value in the 1-15 range (see paragraph. 0047), also notice Table 1 for an example where Patel shows use of 0.6 – 5 wt % non-ionic surfactant, which is encompassed by applicants' claimed range of 0.005-10 wt %. Patel et al. teaches foam compositions

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enable application of a low and uniform pressure to the wafer surface for precision CMP and serve equally well in post-clean and post-CMP rinsing (para. 28). Patel et al. also teaches anionic surfactants, which indicates ionic strength. Patel et al. teach the composition may be used for polishing formulations (i.e. wafer polishing slurry) (see para. 0011). Patel teaches the same wetting composition has corrosive inhibitors and complexing agents capable of scavenging undesirable metal matter (i.e. complexing with trace metal impurities) (see 0041), also teaching the composition is particularly good for cleaning CMP copper substrates (see 0105). Patel et al. teaches pH adjusting (see para. 0110), which indicates a pH. Patel et al. is silent with respect to complexing agents ability to complex with copper residue and impurities left by slurry. However, the composition of Patel would inherently provide the abilities (i.e. properties) as applicants' limitations, because the composition of Patel provides the same composition as applicants limitation, thus would have the same properties as recited in applicant's claim 36.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was

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made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (2003/0171239).

Patel et al. teach methods of CMP rinsing, cleaning, or etching (i.e. wetting – see para. 004), which uses a composition comprising non-ionic surfactant with HBL value in the 1-15 range (see paragraph. 0047), also notice Table 1 for an example where Patel shows use of 0.6 – 5 wt % non-ionic surfactant, which is encompassed by applicants' claimed range of 0.005-10 wt %. Patel et al. teaches foam compositions enable application of a low and uniform pressure to the wafer surface for precision CMP and serve equally well in post-clean and post-CMP rinsing (para. 28). Patel et al. also teaches anionic surfactants, which indicates ionic strength. Patel et al. teach the composition may be used for polishing formulations (i.e. wafer polishing slurry) (see para. 0011). Patel teaches the same wetting composition has corrosive inhibitors and complexing agents capable of scavenging undesirable metal matter (i.e. complexing with trace metal impurities) (see 0041), also teaching the composition is particularly good for cleaning CMP copper substrates (see 0105). Patel et al. teaches pH adjusting (see para. 0110), which indicates a pH.

Patel et al. is silent as to the composition providing the ability to complex with copper residue and impurities.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, that the CMP invention of Patel et al, would have the ability of

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removing trace metal impurities and copper residue because Patel et al. teaches the composition is capable of scavenging undesirable metal matter (para. 0041), (i.e when used with a copper substrate the undesirable metal matter would be copper) and the ability of applicants' limitation would be provided when formulating the composition defined in applicants claim 36.

Applicants do not provide the positive limitation of a copper removal step, only that the composition be "capable" of removing trace impurities and copper residue, therefore the limitation regarding the "ability" of the composition is obvious. (See MPEP 2112.02)

### ***Claim Rejections - 35 USC § 103***

Claims 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (2003/0171239), in view of Cooper et al. (Comparing the effectiveness of knobby and ridged post-CMP cleaning brushes; Micron Technology; July 19999; Micromagazine; archive; [www.micromagazine.com](http://www.micromagazine.com), page 1 of 9).

Although, Patel et al. teaches foam compositions to the wafer surface for precision CMP, post-clean, and post-cmp rinsing (para. 26-29), Patel does not teach the composition is sprayed or brushed on, or that loading occurs via a load cup as in claims 37-39.

Cooper et al. teaches methods for post cmp clean utilizes rotating foam brushes while sprayed, as in claims 37, and 39, to remove excess metal and slurry particles, to avoid adverse effects in downstream processing (see page 1 of 9).

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of applying the CMP post clean composition of Patel et al, by incorporating the use of utilizes rotating foam brushes while sprayed, as in claims 37, and 39, because Cooper teaches the process removes excess metal and slurry particles, to avoid adverse effects in downstream processing.

***Claim Rejections - 35 USC § 103***

Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. and Cooper et al., as applied to claims 37 and 39 above, further in view of Karlsrud et al. (5,329,732).

As to claim 38, the modified teaching of Patel et al. is silent as to the delivery methods implored to transfer the wafer to the post clean station, such as loading the wafer into a load cup, as applicants' limitation of claim 38.

Karlsrud et al. illustrates a well known method implored to transfer the wafer to the post clean station, loading the wafer into a load cup, as applicants' limitation of claim 38 (see col. 11-12, lines 45-17).

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of Patel et al., to include the a well known method implored to transfer the wafer to the post clean station, loading the wafer into a load cup, as applicants' limitation of claim 38, because Karlsrud et al. illustrates it is a well known method.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 40 is rejected under 35 U.S.C. 102(b) as being anticipated by Patel et al. (2003/0171239).

Patel et al. teach methods of CMP rinsing, cleaning, or etching (i.e. wetting – see para. 004), which uses a composition comprising non-ionic surfactant with HBL value in the 1-15 range (see paragraph. 0047), also notice Table 1 for an example where Patel shows use of 0.6 – 5 wt % non-ionic surfactant, which is encompassed by applicants' claimed range of 0.005-10 wt %. Patel et al. teaches foam compositions enable application of a low and uniform pressure to the wafer surface for precision CMP (i.e. a CMP slurry, which would have a pH of +/- 1 pH unit of the slurry) and serve equally well in post-clean and post-CMP rinsing (para. 28). Patel et al. also teaches anionic surfactants, which indicates ionic strength. Patel et al. teach the composition may be used for polishing formulations (i.e. wafer polishing slurry) (see para. 0011). Patel teaches the same wetting composition has corrosive inhibitors and complexing agents capable of scavenging undesirable metal matter (i.e complexing with trace metal impurities) (see 0041), also teaching the composition is particularly good for cleaning CMP copper substrates (see 0105). Patel et al. teaches pH adjusting (see para. 0110), which indicates a pH. As to the ionic strength of the



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composition, as the limitations of applicants' claim 40, products of identical composition can not have mutually exclusive properties (see MPEP 2112.01).

***Claim Rejections - 35 USC § 103***

As to claims 41 and 43, see discussion toward claims 37, and 39 above.

As to claim 42, see discussion toward claim 38 above.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia A. George whose telephone number is (571)272-5955. The examiner can normally be reached on weekdays between 7:00am and 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571)272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patricia A George  
Examiner  
Art Unit 1765

  
PAG  
06/05

SUPERVISORY PATENT EXAMINER  
NADINE NORTON 1765

